specific conductance and chloride concentration (fig. 13). Specific conductance ranged from approximately 70 µS/cm (microsiemens per centimeter) for freshwater taken several miles upstream from the saltwater-freshwater interface to approximately 50,000 µS/cm for Atlantic Ocean seawater.

A specific conductance of 950 µS/cm for water in the AICW is approximately equal to a chloride concentration of 250 mg/L (milligrams per liter) which is the maximum allowable concentration for secondary drinking water standards (U.S. Environmental Protection Agency, 1981). For purposes of this study, a specific conductance of 950 µS/cm was selected as the indicator of the location of the saltwater-freshwater interface.

Water discharge significantly affects the vertical distribution of specific conductance in the AICW. During low flow the vertical distribution of specific conductance near the deepest part of a given cross section is relatively homogeneous, whereas during high flow the vertical distribution of specific conductance changes dramatically in the zone of transition from freshwater to seawater (fig. 14). As is apparent from figure 14, specific conductance near the surface can be reduced by more than an order of magnitude during high flows. Because of the variance in vertical distribution of specific conductance, the location of the saltwater-freshwater interface is further defined for this study as a specific conductance of 950 umhos/cm approximately 1 foot above the channel bottom. Defining the saltwater-freshwater interface in this manner provides the location of the maximum intrusion of water that exceeds the chloride concentration for secondary drinking water standards, with minimal effect from variations in the slope of the saltwater-freshwater interface.

Figure 15 shows the effect of water discharge on the specific conductance gradient as measured 1 foot above the channel bottom. During high flow the zone of transition from freshwater to Atlantic Ocean seawater is short and the longitudinal specific conductance gradient is steeper than the gradient during low flow.

The location of the saltwater-freshwater interface at high-slack water for the 1982 water year is shown in figure 16a. The interface location is based on readings taken at approximately bi-weekly intervals. Also shown in figure 16b are the daily mean discharges for the 1982 water year. This general comparison of interface location and water discharge shows that as the daily mean discharge decreases, the saltwater-freshwater interface moves southward and as discharge increases, the interface moves toward the north.

The change in specific conductance at a point in a cross section is also affected by water discharge and is closely related to the stage at the cross section. The change in specific conductance with change in discharge and stage at the Briarcliffe Acres gage is shown in figure 17. The data presented are for the period September 16-18, 1982. The highest specific conductance values at the Briarcliffe Acres gage for the 1982 water year were recorded during this period. Specific conductance changes closely follow stage changes with maximum specific conductance occurring less than two hours after the maximum stage.